Wisconsin Highway Research Program
Request for Proposal for

Aesthetic Coatings for Bridge Components

Proposals must be submitted
no later than
Wednesday, March 3, 2010

For further information regarding this RFP
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Researcher Proposal Preparation Guidelines

WHRP Proposal Guidelines are available on the WHRP website (http://www.whrp.org/rfps-and-guidelines.html?current=three&sub=none). Please refer to these instructions in preparation of your response.

I. Background and Problem Statement

A bridge, whether intentional or not, becomes an aesthetic statement for the owner. One common method for improving bridge aesthetics is to utilize the application of color to concrete bridge components (parapets, girders, piers, abutments, and wingwalls) and to steel bridge components (railings and girders). Unfortunately, the Wisconsin Department of Transportation (WisDOT) has experienced a number of issues with these applications, including peeling, fading, vandalism (including graffiti), rust bleeding, etc. It is the intent of this research to find better methods and materials to be used for aesthetic treatments so that the longevity and cost effectiveness of the practice can be better realized. It is also understood that some of these products, in addition to providing aesthetic benefits, also provide enhanced material protection (chlorine ion penetration, rust inhibitors, etc.) and improved graffiti resistance. These benefits should be considered in the decision making process.

II. Objectives

The objective of this research is to investigate methods and products to be used in the aesthetic coating of bridge components and to develop a guideline for cost-effective bridge aesthetic practices.

III. Scope of Work

Research tasks shall be as follows:

Task 1: Collect, review, and interpret relevant practice, performance data, research findings, and other information related to aesthetical treatments of bridge components.

Task 2: Survey WisDOT engineers, contractors, consultants, State DOT's, and manufacturers to obtain information regarding materials used, application, structural details, repairs/maintenance of coating, material protection benefits of coating, graffiti resistance of coating, costs, etc.

Task 3: Submit an interim report detailing the findings of tasks 1 and 2 to the Project Oversight Committee (POC) for review. Also, submit a revised work plan detailing testing to take place in Task 4 as well as suggested products to be tested. ASTM testing procedures for durability of coatings shall be utilized, as necessary. Approval of work plan by POC must be obtained prior to Task 4 execution.

Task 4: Execute the POC approved laboratory testing plan as well as the necessary field site visits. At a minimum, this testing shall include weathering characteristics and repair capability of coatings.

Task 5: Identify future research needs to expand the findings of this project.

Task 6: Develop special provisions for applications to both concrete and steel. Include single and multi-color (replicating varying natural stone coloration) applications for concrete. Develop structural details for railings to help prevent rust bleeding. Recommend updates to the WisDOT Bridge Manual as well as any standard drawings, and develop an approved products list for WisDOT.

Task 7: Submit a draft final report three (3) months prior to end of contract for Technical Oversight Committee (TOC) review. Present findings to TOC

Task 8: Revise and submit final report.

IV. Specific Results, Findings, Tools, etc. (Deliverables)

Reporting Requirements: 36 Hard Copies Delivered to WHRP by the contract end date. This includes the report, special provisions, and structural details. Recommended updates to the WisDOT Bridge Manual shall also be included in the Appendix of the report.

Presentation Requirements: All projects require the PI to give a closeout presentation after submittal of the draft final report. This presentation will be given to the Structures TOC.

V. Budget and Time Frame

The project shall be completed in 24 months with a budget not to exceed $120,000. An interim report detailing the findings of Task I and II shall be submitted 9 months after the project start date. The draft final report shall be submitted 3 months prior to end date of project to allow time for TOC review and comments.

VI. Implementation

The final report shall detail all aspects of the research and findings. Also, recommendations to the WisDOT bridge manual, special provisions and standards shall be submitted.

VII. Special Notes

- It is envisioned that this project will include a survey of other states with climates similar to Wisconsin to ascertain what products are being used along with application, repair techniques, durability, etc. as well as contact with WisDOT Regional Engineers, Manufacturers and contractors. Laboratory testing will be performed.
- The literature review should at a minimum investigate other research projects addressing this issue, other State DOT publications, as well as specifications outside of WisDOT. Product specific literature should also be investigated.
- Investigate current steel railing installations (shop drawings and field verification) for compliance with current standards and performance to visually inspect issues with fit-up and rust bleed. It is envisioned that no more than five bridges shall be

investigated. Field visits to problematic concrete coating applications should also be considered.

- The PI should submit, as a part of the proposal, a proposed work plan for all tasks listed above. There will be opportunity for revision to this work plan during Task 3 of the research, but the original work plan proposal will be used as a basis for selecting the PI.
- Travel will be required to visit bridge sites, to meet with the project oversight committee as needed, and to present the report.
- All above tasks shall be addressed in the proposal. However, research isn't limited to the above tasks.
- WisDOT Bureau of Structures will provide existing special provisions and structural details as required. Other contacts (WisDOT region staff, contractors, consultants other DOT's and manufacturers) will be part of the research.
- This investigation shall at a minimum include the following:
    - Concrete coloring practices
        - Material (paint, penetrating stain, etc.)
        - Surface preparation
        - Application (spray, roller; temperature, rain; minimum curing time prior to application, etc.)
        - Durability (fading, peeling, etc.)
        - Repair (peeling, flaking, graffiti removal, etc.)
        - Material protection (chlorine ion penetration resistance)
        - Graffiti resistance
        - Cost
    - Steel railings
        - Railing details (drain, vent and bolt holes, field erection and expansion joints, member properties to avoid warping during hot dip galvanizing)
        - Material (paint systems for bare steel, paint systems for galvanized steel, anodized aluminum pedestrian rails, PVC coating)
        - Surface preparation (bare steel for paint, bare steel for galvanizing, galvanized steel for paint, aluminum rails)
        - Application
        - Durability
        - Material protection
        - Graffiti resistance
        - Cost